

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No.: 09/923,157

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. *(Currently Amended)* A system comprising:

a plurality of data centers, including a first data center and a second data center, each data center comprising:

a storage system; and

a host server;

a directory server;

~~at least one of~~ a plurality of access gateways;

a network interconnecting said plurality of data centers, said directory server, and said

plurality of access gateway; wherein each of said plurality of data centers is accessible

from at least one of said plurality of access gateways and wherein,

responsive to input received via any one of said ~~at least one of~~ a plurality of access

gateways, any of said plurality of data centers may be configured as a primary (source) of

data, and any of said plurality of data centers may be configured as a secondary (target)

of data in a copy operation.

2. *(Currently Amended)* The system of claim 1, wherein, responsive to said input received via any of said ~~at least one of~~ a plurality of access gateways, information about said first data center and said second data center is fetched from said directory server, and thereupon, said

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first data center may be configured as a primary (source) of data, and said second data center may be configured as a secondary (target) of data in a copy operation.

3. *(Currently Amended)* The system of claim 2, wherein, responsive to a second input received via any of said ~~at least one of a~~ plurality of access gateways, said first data center may be reconfigured as a secondary (target) of data, and said second data center may be configured as a primary (source) of data in a second copy operation.

4. *(Original)* The system of claim 3, wherein copy operations are synchronous, said first data center updating contents of storage from contents of a cache memory prior to being reconfigured to as a secondary (target) in said second copy operation.

5. *(Original)* The system of claim 2, wherein said information fetched from said directory server comprises proximity information for a source of said input received via said at least one of a plurality of access gateways, and wherein said first data center is configured as a primary (source) of data, and said second data center is configured as a secondary (target) of data in said copy operation based upon said proximity information.

6. *(Original)* The system of claim 2, wherein said plurality of data centers further comprises a third data center, said third data center being configured as another secondary (target) of data in a copy operation.

7. *(Original)* The system of claim 1, further comprising a network interface that provides connection between at least one of a plurality of access gateways and a user terminal.

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8. *(Original)* The system of claim 1, wherein information associated with a virtual volume is stored in a plurality of real volumes in said storage system.

9. *(Original)* The system of claim 8, wherein a correspondence between said virtual volume and said plurality of real volumes in said storage system is stored in said directory server.

10. *(Original)* The system of claim 1, wherein a storage volume from said first data center and a storage volume from said second data center comprise a copy volume group.

11. *(Original)* The system of claim 1, said directory server further comprising a log in process and a virtual volume information.

12. *(Original)* The system of claim 1, said host server further comprising a copy volume group interface process, a read request issue process, and a write request issue process.

13. *(Original)* A method, comprising:
receiving a virtual volume name and network interface ID for a user;
finding a virtual volume corresponding to said virtual volume name and network interface ID;
selecting a real volume information corresponding to a data center to which said user is logged into;
determining whether said data center is primary;

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if said data center does not contain a primary volume, issuing a request to change a volume within said data center to a primary volume, waiting for a response to said request, re-setting a current primary volume, and setting said volume within said data center to be primary; and

returning a real volume information for said volume within said data center set to primary.

14-21. (*Canceled*)

22. (*New*) A system comprising:

a plurality of data centers, including a first data center and a second data center, each data center comprising:

a storage system; and

a host server;

a directory server;

a plurality of access gateways;

a network interconnecting the plurality of data centers, the directory server, and the plurality of access gateways; wherein each of the plurality of data centers is accessible from at least one of the plurality of access gateways and wherein, responsive to an input received via any one of the plurality of access gateways, any of the plurality of data centers is operable to initiate a bi-directional data copying operation with any other of the plurality of data centers.

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23. (New) The system of claim 22, wherein responsive to the input, the directory server is operable to furnish information on the first data center and the second data center.

24. (New) The system of claim 23, wherein the furnished information is indicative of a proximity of the one of the plurality of access gateways associated with the received input and at least one data center and wherein the first data center is selected from the plurality of data centers based on the furnished information.

25. (New) The system of claim 22, wherein each of the plurality of data centers is operable to act as a primary (source) or a secondary (target) in the data copying operation.

26. (New) The system of claim 25, wherein each of the plurality of data centers is configurable as the primary (source) or the secondary (target) based on a proximity information received from the directory server in response to the input.

27. (New) The system of claim 22, wherein data stored in the storage system of each of the plurality of data centers is organized into at least one virtual volume.

28. (New) The system of claim 27, wherein the storage system of each of the plurality of data centers stores information associating the at least one virtual volume with a corresponding physical volume.

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REMARKS

Claims 1-13 and 22-28 are all the claims pending in the application. Claims 14-21 are being cancelled by Applicants without prejudice. Applicants amended claims 1, 2 and 3 to more precisely recite the invented subject matter. Applicants also added new claims 22-28 to more fully recite the invented subject matter. No new matter was introduced.

The Examiner rejected claims 1-13 as being allegedly anticipated by Carini et al. (U.S. Patent No. f). In response to this rejection, Applicants amend independent claim 1.

The amended claim 1 recited a feature of the inventive configuration, wherein each of the plurality of data centers is accessible from at least one of the plurality of access gateways. This feature is not taught or suggested by Carini et al. In more detail, Carini et al. discloses a computer system for synchronizing a mobile device 406, 408 or 410 with a remote enterprise database 404, see Carini et al., abstract, ln 2 and Fig. 4. Because the mobile devices may not access the enterprise database 404 directly, the system of Carini et al. facilitates replication of data to mobile devices by providing several replication databases 420, which maintain image copies of data in the enterprise database 404 and which are accessible by those mobile devices, see Carini et al., abstract, ln 3-4. When the mobile devices access the replication databases 420, they synchronize their respective storage units with the data stored in the accessed replication database 420. Thus, in Carini et al. mobile devices may only access the replication database 420, but may not access the enterprise database 404.

On the other hand, the amended claim 1 recites a feature of the invention, wherein each of the plurality of data centers is accessible from at least one of the plurality of access gateways.

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This recited feature clearly distinguishes the claimed invention from the system of Carini et al. Applicants further note that in the system of Carini et al. the bi-directional replication does not exist between separate replication databases 420. The data in Carini et al. is bi-directionally replicated only between the enterprise database 404 and the replication databases 420, see col. 6, ln 54-66. Therefore, the Examiner may not read the "first data center" element and the "second data center" element of claim 1 on two separate replication databases 420.

Applicants further note that at page 2 of the Office Action the Examiner appears to read the claim term "second data center" on the mobile devices 406-410 shown in Fig. 4 of Carini et al. Applicants respectfully submit that the Examiner's reading is incorrect for several reasons. First, a mobile device is not a data center. Second, the aforesaid mobile devices 406-410 do not include the "host server" element of the "data center" recited in claim 1. The Examiner is further mistaken in reading the "host server" element of "second data center" recited in claim 1 on the replication database 420 of Carini et al. because the replication database 420 is a separate component of the system of Carini et al. and not part of any of the mobile devices 406-410, see Carini et al., Fig. 4. Therefore, the mobile devices 406-410 of Carini et al. are not "second data center."

Additionally, as stated above, the enterprise database 404 of Carini et al. is also not the "second data center" because it is not acceptable from a gateway, as required by the claim 1. Finally, for the above-stated reasons, the replication database 420 also may not be the "second data center." Thus, for all the foregoing reasons, Carini et al. fails to teach or suggest the

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"second data center" as required by the amended claim 1. Therefore, claim 1 is not anticipated by Carini et al.

Applicants further respectfully submit that Examiner's rejection of claims 2-12, dependent upon claim 1, is rendered moot by the present amendment and that these claims are patentable at least due to their dependence on the patentable independent claim 1.

With respect to claim 13, the Examiner alleges that all elements of that claim are disclosed in Carini et al. Applicants respectfully disagree. Applicants carefully examined the portion of Carini et al. cited by the Examiner, including col 7, ln 55-60; col 6, ln 42-66; col 6, ln 12-25 and ln 54-61, as well as the remainder of Carini et al., but could not find the description of multiple limitations of claim 13, and, specifically, the "virtual volume" "virtual volume name", "network interface ID for the user", "finding a virtual volume corresponding to said virtual volume name and network interface ID", "selecting a real volume information corresponding to a data center to which said user is logged into", "determining whether said data center is primary", "if said data center does not contain a primary volume, issuing a request to change a volume within said data center to a primary volume, waiting for a response to said request, re-setting a current primary volume, and setting said volume within said data center to be primary" and "returning a real volume information for said volume within said data center set to primary."

"[W]hen the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference." In re Rijckaert, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (citing In re Yates, 663 F.2d 1054, 211 USPQ 1149, 1151 (CCPA 1981)). Thus, is the Examiner continues to maintain that Carini et al.

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teaches all limitations of claim 13, Applicants respectfully request the Examiner to point them to specific language of the reference containing the alleged teaching. Applicants' examination of the portions of Carini et al. cited by the Examiner did not reveal any such teachings. For this reason, claim 13 is not anticipated by Carini et al.

Applicants added new claims 22-28 to more fully recite the invented subject matter. The newly added claims are fully supported by the specification and do not introduce any new matter. The new claims are believed to be patentable in view of the above arguments.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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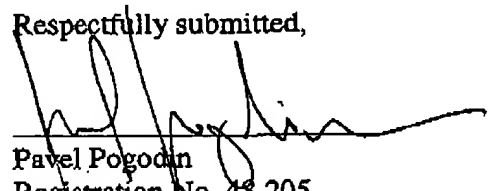
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Respectfully submitted,


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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this AMENDMENT UNDER 37 C.F.R. § 1.111 is being facsimile transmitted to the U.S. Patent and Trademark Office this 28th day of December, 2005.


Mariann Tam